

Amendments to the Specification:

Page 4, amend the paragraph beginning on line 7 to read as follows:

In addition thereto, according to the present invention, for accomplishing the object mentioned above, there is also provided a servo pattern ~~recoding~~recording method for a magnetic disk apparatus, having a magnetic disk for recording information thereon; a head having a write element for use of recording information onto said magnetic disk and a read element for reproducing information from said magnetic disk; and an actuator for moving said head to a desired radial position on said magnetic disk, comprising the following steps of: recording a servo pattern for positioning of said head on a recording surface of said magnetic disk; recording marker patterns for detecting passage time of said head, disposing in a front and a rear of said burst pattern for detecting a radial position of said head, respectively, on a track in a circumferential direction, on said servo pattern ~~recoded~~recorded on the recording surface of said magnetic disk; and conducting a self servo write operation by said magnetic disk apparatus with using said servo pattern.

Page 1, amend the paragraph beginning on line 24 to read as follows:

Also, according to the present invention, in the servo pattern ~~recoding~~recording method for a magnetic disk apparatus, as described in the above, preferably, the marker pattern of said servo pattern written on the recording surface of said magnetic disk is recorded by shifting it with respect to the marker pattern of said servo pattern, which is written neighboring thereto in the circumferential direction of said magnetic disk, by a half of width thereof, on the position in a radial direction thereof, when conducting said self servo write operation, or a distance is measured between the servo patterns neighboring to each other by reproducing two (2) of said servo patterns neighboring to each other in the circumferential direction,

which are recorded on the recording surface of said magnetic disk, and upon basis of this distance measured is adjusted a timing of writing when recording a new servo pattern, when conducting said self servo write operation.

Page 6, amend the paragraph beginning on line 1 to read as follows:

Fig. 6 is a view for showing a method for adjusting a timing for recording upon ~~recoding~~recording the new pattern, when performing the self-propagating operation, in the magnetic disk apparatus mentioned above, according to the present invention;

Page 6, amend the paragraph beginning on line 22 to read as follows:

As is shown in the figure, the magnetic disk apparatus includes a casing 101 and comprises a disk 102, being a recording medium for recording information on the surface thereof, and a head 103 for recording and/or reproducing signals (i.e., the information) on/from said recording medium. This head 103 is pivotally supported being rotatable around a pivot 105, and is moved to an arbitrary radial position on the ~~recoding~~recording medium 102 mentioned above, due to the function of a voice coil 104 (hereinafter, being described by "VCM") as an actuator thereof. Also, this head 103 is driven through a recording/reproducing driver IC 106, thereby executing recording/reproducing operation thereof. However, this head 103 turns out on a ramp mechanism 107 locating in an outside of the disk 102 when conducting no recording/reproducing operation thereof; i.e., it is held thereon under the condition of being separated from the surface of the disk 102. Also, in the lower portion of Fig. 1, there are shown the servo signal (i.e., the servo patterns) 110, 110..., which are written on the disk 102 with using the head 103 equipped with, in the magnetic disk apparatus mentioned above.

Page 9, amend the paragraph beginning on line 28 to read as follows:

And, according to the present invention, in addition to each of the constituent elements of the servo pattern mentioned above, the followings are also disposed thereafter: i.e., a second preamble 207b, at the last portion of the pattern of each the servo sector 110, and a second sector marker 208b ~~208~~, continuing to each other. Although those second sector markers are used upon ~~recoding~~ recording of a new pattern(s), when conducting the self-propagating operation in the self servo write operation, however a method will be mentioned in the details thereof, later.

Page 13, amend the paragraph beginning on line 2 to read as follows:

Next, explanation will be given on so-called the self-propagating operation, in which the patterns are spread by ~~recoding~~ recording new patterns on the disk 102, as a portion of the self-servo operation, while controlling the positioning of the head 103 through the servo patterns, the details of which was shown in Figs. 3(a) and 3(b) mentioned above, by referring to Figs. 4(a) and 4(b) attached herewith.

Page 13, amend the paragraph beginning on line 27 to read as follows:

First, in the operation shown in Fig. 4(a) mentioned above, a servo process enabling signal 202 when ~~recoding~~ recording the block 301c and a write gate signal 302 are shown by a reference numeral 305 in the figure, collectively. Thus, so as to conduct the detection of the head position for the positioning control, as indicted by reference numerals 303a and 303b in the figure, by turning the servo processor circuit 515 mentioned above (see in Fig. 2 mentioned above) into active two (2) times, the amplitude of the burst patterns of the two (2) servo sectors 101a and 101b. Then, after passing through those servo sectors 110a and 110b, the record

element 103b of the head 103 writes a pattern of the block 301c, by turning the write gate signal 302 to be active, in a section when passing through the servo sector 110c.

Page 14, amend the paragraph beginning on line 25 to read as follows:

After ~~recoding~~recording the both blocks 301a and 301b on an entire of one (1) round on the disk 102 mentioned above, in the manner as was explained above, next the head 103 is moved into an outer periphery side by only 0.5 servo track, thereby conducting recording on the blocks 301b and 301d. A positional relationship between the record/read elements 103a and 103b and the patterns in this instance is shown in Fig. 4(b).

Page 14, amend the paragraph beginning on line 32 to read as follows:

Namely, detection is made on the head position during the active sections 303a and 303b of the servo process signal, which are shown by the reference numeral 307 in the figure, in the similar manner when conducting the recording on the blocks 301a and 301c mentioned above, and during the section 304d where the write gate is active, recording is conducted on the block 301d. Following thereof, during the sections 303c and 303d where the servo process signal is active, shown by a reference numeral 308 in the figure, detection is conducted on the head position, and further during the section 304b where the write gate is active, recording is conducted on the block 301d. After completing the recording on both of the blocks 301a and 301b in an entire of one (1) round in this manner, the head 103 is moved into the outer periphery side by 0.5 servo track, and again, recording is conducted on the blocks 301a and 301c (see Fig. 4(a) mentioned above). According to the steps

mentioned above, both can be achieved; i.e., while conducting the positioning of the head (i.e., the record/read elements 103a and 103b) without causing interference between the reproducing operation and the ~~recoding~~recording operation conducted by means of the head 103, and at the same time is conducted the writing of the new patterns.

Page 15, amend the paragraph beginning on line 20 to read as follows:

Hereinafter, ~~recoding~~recording of the new patterns is repeated, in accordance with the processes mentioned above, but exchanging the burst patterns 210a to 210d, accompanying with the movement of the head in the radial portion thereof, so that it does not overlap with the burst pattern, which was already recorded on the block neighboring therewith, as is similar in the conventional art.

Page 15, amend the paragraph beginning on line 20 to read as follows:

As was explained in the above, according to the present invention, the second preamble 207b and the second sector marker 208b are disposed, also at the last portion thereof, together with the preamble 207a and the sector marker 208a, which are disposed at the head of the pattern, as the pattern for use in detection of timing, in each of the servo sectors recorded and disposed on the disk 102, in the magnetic disk apparatus having the self servo writing function. And, this second sector marker is used upon ~~recoding~~recording the pattern newly, when conducting the self-propagating operation in the self-servo write operation.

Page 16, amend the paragraph beginning on line 2 to read as follows:

However, as was mentioned in the above, the rotation of the disk fluctuates in the speed thereof, and therefore the rotation speed of the disk at the time when ~~recoding~~ recording the pattern is not always coincident with the rotation speed at the time when trying to write the pattern newly next. However, as was mentioned in the above, the second preamble 207b and the second sector marker 208b are disposed, also at the last portion thereof, together with the preamble 207a and the sector marker 208a, which are disposed at the head of the pattern, as the pattern for use in detection of timing, and with using those, it is possible to shorten the time period from the time when detecting (i.e., reproducing or reading) the pattern up to the time when writing the pattern newly next. Namely, the cause of errors on writing in the circumferential direction of the disk, due to the fluctuation of the rotation speed of the disk, can be suppressed, thereby protecting the servo signals from lowering in the quality thereof, such as, causing the shift in the bit phase between the tracks neighboring with each other, etc., for example. In other words, it is possible to provide the magnetic disk apparatus, hardly receiving an ill influence from the fluctuation on the rotation speed of the disc when concocting the servo write operation. For this reason, according to the present invention, an effect can be obtained remarkably, in particular, when it is applied into the magnetic disk apparatus, having a disk of a small diameter.

Page 18, amend the paragraph beginning on line 18 to read as follows:

In Fig. 5(a), all the blocks are recorded in the servo sector 110e, while only the burst in the servo sector 110f. In the case of this embodiment, since the distance of offsetting of the burst in the radial direction is a half ($1/2$) of the servo track, as is

in the embodiment mentioned above, when recording on the servo sector 110e, the bursts 407 recorded in advance are deleted, if conducting the write operation is conducted on the block as a whole as was mentioned above. For this reason, the write gate is turned to OFF at the portions other than the burst 402a to be written, as is indicted by a section 404a, thereby inhibiting deletion through writing thereon. On the other hand, on the servo sector 110f, for detection of position of the head, the servo process enable signal 202 is turned to be active during a section 403 from the sector head to the last burst. And, the write gate signal 302 is turned to be active only during a section 404 of the burst to be ~~recoded~~recorded newly, thereby recording the burst 402b thereon. Generally, in the head used in the magnetic disk apparatus, it is impossible to conduct the reproducing operation during the recording operation. For this reason, during the section of the burst 402b to be recorded, the read element 103a cannot to read out the amplitude of the burst.

Page 19, amend the paragraph beginning on line 23 to read as follows:

In case of ~~recoding~~recording only one (1) burst among of them while conducting the position detection of the head with using the servo sector, as was mentioned above, it is necessary to complete exchanging of the head from the reproducing operation to the recording operation, or exchanging on the contrary, during the sections locating between the burst to be recorded and the bursts in a front and a rear thereof. Then, for the section 406 between the front and the rear of each burst, it is necessary to be ascertained a length enabling to absorb a time for exchanging operation mode of the recording/reproducing drive 106 and a time shift caused due to the distance between the read element 103a and the record element 103b in the circumferential direction. Further, the operation, which is conducted in

the servo sectors 110e and 110f mentioned above, will be conducted on all of the sectors of one (1) round of the disk, in the similar manner.

Page 20, amend the paragraph beginning on line 22 to read as follows:

In the above, explanation was given on the steps of the so-called self-propagating operation; i.e., ~~recording~~recording new patterns while controlling the positioning of the head through reproduction of the servo sectors, at the same time. Also, when recording the new patterns actually, it is necessary to fit the bit phase, between the pattern recorded in advance and that to be written newly on the tracks neighboring with each other.